ADDENDUM

In re DOTY

Attorney Docket SD8342

"Clean Version of the Amended SPECIFICATION"

ON PAGE 1, BEGINNING AT LINE 18

IN THE PARAGRAPH BEGINNING WITH THE WORDS "Generally, semiconductor detectors ..." AND ENDING ON THE WITH THE WORDS "...their gas-filled counterparts", PLEASE AMEND THE SPECIFICATION WITH THE REPLACEMENT PARAGRAPH SHOWN BELOW.

A1

Generally, electronic detectors of nuclear radiation operate by exploiting the fact that incident radiation, by interaction in the detector volume, will create a charge pulse consisting of holes and electrons that can be separated under the influence of an electric field and the current detected by an external circuit. The conversion efficiency of solid state detectors is typically 100 to 1000 times greater than that of conventional gas-filled tubes consequently, solid state detectors are more sensitive than conventional gas-filled tubes. Moreover, solid state detectors are generally more compact, robust, and reliable than their gas-filled counterparts.

ON PAGE 4, BEGINNING AT LINE 2

IN THE PARAGRAPH BEGINNING WITH THE WORDS "The result of neutron interaction ..." AND ENDING WITH THE WORDS "...perpendicular to the crystallographic *c* axis", PLEASE AMEND THE SPECIFICATION WITH THE REPLACEMENT PARAGRAPH SHOWN BELOW.

A2

The result of neutron interaction described above is a detectable current pulse. In the invention, the ionizable medium is hexagonal boron nitride (hBN), and preferably pyrolytic hexagonal boron nitride. The material of the present invention may be a single crystal, or it may be disordered. For example, the material may be a polycrystalline aggregate or a layered structure, refer to as "tubrostratic," which exhibits long range

A2 cancel

crystallographic order in that the hexagonal crystallographic *c* axis in each layer is generally aligned in a common direction. Current pulses produced by conversion of the incident neutrons to energetic charged particles are detected by applying an electric field to the body of the hBN detector in a direction about perpendicular to the crystallographic *c* axis.

ON PAGE 6, BEGINNING AT LINE 5

IN THE PARAGRAPH BEGINNING WITH THE SENTENCE "Additional testing was done ..." AND ENDING WITH THE WORDS "...indicated as a horizontal line in FIG. 2", PLEASE AMEND THE SPECIFICATION WITH THE REPLACEMENT PARAGRAPH SHOWN BELOW.

A3

Additional testing was done with 3.4 MeV protons (^{1}H) from an accelerator. When these protons were directed on the device of FIG. 3, no detectable signal was produced. In consideration of the above results, it is clear that both the energy deposited (*E*) and the rate of energy deposition (dE/dx) are important in generating a signal in the device of the invention. Therefore, the insensitivity to gamma radiation from the nuclear reactor is due not only to the low atomic numbers of the constituents of the hBN, but to the existence of a dE/dx threshold. This threshold is between the maximum dE/dx for a proton (^{1}H) and that of an alpha particle (^{4}He). The lower bound for this threshold is about 12 eV/Angstrom, and is indicated as a horizontal line in FIG. 2.
